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THE TOTAL SOLAR ECLIPSE OF JUNE 8, 1918

BY SIDNEY D. TOWNLEY

My observations of the eclipse of June 8th were made at Baker, Oregon. I left Stanford University on May 11th, gave fifteen lectures on "Solar Eclipses" at various places in the states of Oregon and Washington, and after visiting Chehalis, Goldendale, Arlington and Baker, all located near the central line of totality, decided to locate my telescope at the last named place. I had the pleasure of visiting the Lick Observatory Station at Goldendale and the United States Government Station at Baker and of watching the preparations made by the astronomers of these two expeditions, for the observation of this interesting phenomenon. As this was the first opportunity I had had of viewing a total solar eclipse I preferred to spend my time viewing the general phenomena of the eclipse rather than being tied down to a rigorous program of scientific observations.

Baker is located at the eastern end of a large valley at an altitude of 3,500 feet. I have visited that part of Oregon many times during the last twenty-five years and know that the skies are at times wonderfully clear. During the first week in June of this year, however, the weather was not favorable. The spring had been an unusually dry one and the country needed a good drenching rain much more than an eclipse of the Sun. The nights and mornings were usually clear but by afternoon the sky was at least partially covered by cirrous or cumulous clouds, which reached their maximum density at about the time of the total phase of the eclipse. The weather on June 8th was the same as on preceding days. In the early afternoon the clouds were so thick that we almost lost hope of seeing the eclipse, but as the time of totality approached the clouds thinned somewhat and during totality they nearly cleared away so that during the last half minute of totality the sky in the neighborhood of the Sun was nearly clear, and within five minutes after totality the sky was perfectly clear around the Sun.

The telescope which I used was a six-inch reflector, of five feet focal length, belonging to Stanford University. It was provided with a temporary alt-azimuth mounting. The mirrors, which were ground by Professor G. W. Ritchey, of the Mount Wilson Solar Observatory, give excellent definition. The telescope was located on the old reservoir hill immediately east of Baker, several hundred feet above the level of the city and about two and one-half miles east of the government station. We had a clear view to the northwest of twenty miles or more but the view to the southeast was broken by other hills. I did not make a determination of the latitude and longitude of the station. This location was chosen so that I might obtain an unobstructed view of the on-coming shadow.

My program consisted of three parts: (*a*) to watch the approach of the shadow; (*b*) to observe the shadow bands; and (*c*) to study the structure of the inner corona with the telescope. The clouds interfered more or less with all three parts of this program.

The Moon's shadow, as we know, moves across the country with great speed, and I had read in books of the awe-inspiring, almost terrifying, spectacle presented in watching the on-rushing shadow. Possibly I expected too much, but it is certain that my expectations were not realized. As totality approached a general gloom was seen to spread over the landscape to the northwest but the whole effect was very indefinite, probably due to diffused light from the clouds in the neighborhood of the Sun. Immediately after second contact the horizon clouds to the north were illuminated with a beautiful sunset glow.

A sheet was spread upon the ground for the purpose of observing the shadow bands. At second contact no sign whatever of shadow bands was seen. At third contact they were seen but not very distinctly. I described them in my notes as shadow *waves*. A stick laid upon the sheet in the direction of the bands was found, by means of a compass, to have a direction 45° west of south. The waves were not sufficiently definite to enable me to obtain any reliable estimate of the speed of propagation; they ceased to visible at 4: 6: 19 (mountain time). There was a light wind from the northwest.

The solar prominences presented a wonderfully beautiful appearance in the telescope. Six large ones were seen and next to *Saturn* I think these prominences were the most fascinating celestial objects I have ever seen. My purpose was to study the inner corona but I found it almost impossible to keep my eyes from the prominences.

During the first part of totality the corona was partly obscured by clouds and it was only during the last half minute that the details could be seen well. There was not sufficient time then to make drawings or for a detailed study of different parts, but the polar streamers especially were seen in very considerable detail. I have examined the negatives taken by the Lick Observatory and find that those taken with the 40-foot camera show the streamers or the inner corona in wonderful form. My 6-inch telescope did not show more of detail than is seen on the photographs, but the comparison is hardly fair to the visual observations because at no time during totality was the Sun's surface entirely free from clouds. With ideal weather conditions I believe the 6-inch reflector would show the details of the corona with great distinctness.